

NEW DISCOVERIES



ALL OVER THE EARTH

Why Your Own BODY Is the Best WEATHER PROPHET

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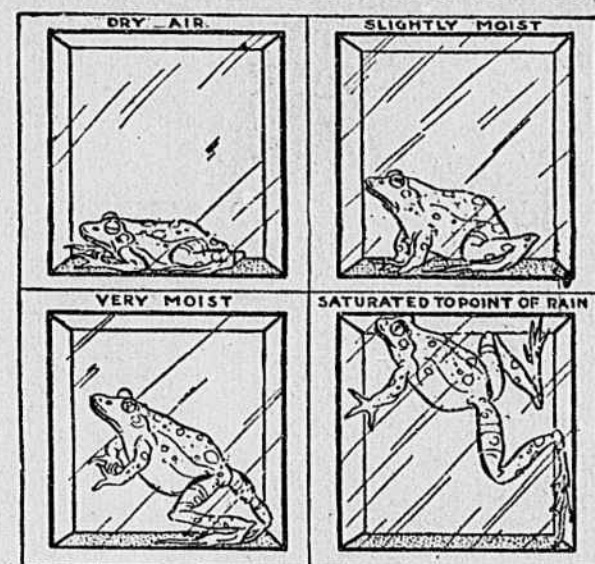
TIME was when every farmer with the rheumatism and every woman with a bunion maintained stoutly that they could tell when it was going to rain. Indeed, most homely folk were convinced that they were better able to prognosticate a wet spell than all the weather bureaus in the world.

Then along came science with a hard blow at these comfortable and comforting predictions of what it was pleased to call the "uneducated observer." Dr. William Osler and others hammered hard at these "superstitions of the common people."

Thus these scientists dismissed the matter to their own entire satisfaction.

Now, however, many excellent investigators present positive proof that almost every species of animal known, from caterpillars to giraffes, are noticeably affected by wetness of the air, dryness of their

Science Discovers That ACHES and PAINS in the HUMAN TISSUES Are a Reliable Indication of Approaching STORMS or CHANGES in TEMPERATURE



"Frogs kept in glass cases, where the humidity was artificially regulated, showed a degree of activity in proportion to the amount of moisture in the air. Where the air was dry the frogs showed few signs of life; but in the cases where the atmosphere approached the degree of saturation which precedes rain they displayed more and more restless activity."

surroundings, humidity, coming rain or snow, and the like.

According to the species of animals, its relation to the insect world, or its nearness to man in the scale of life, its ground habits or its atmospheric habits, the



These Recent Experiments Bear Out the Popular Belief in the Value of the Spots in a Goosebone in Forecasting the Weather. The Diagram Shows How a Goosebone Last Year Foretold an Open Winter Up to the Middle of December and Severe Weather Into April and May.

amount of water vapor present in the atmosphere around it, will have

a definite effect upon its body.

Earth worms, long before a rain appears, will begin to move about, crawl surfacewards, and become very aggressive. They will burrow in various directions, gather leaves and store up food. With the approach of a dry spell they cease their busy movements and become slow and sluggish.

Unsatisfied with such observations as these alone, two zoologists of the Smithsonian Institute in Washington have carried out extensive experiments upon worms and many other creatures. They arranged artificial conditions of varying amounts of dry air, moist air, water-vapor and humidity up to the point of saturation or rain.

There is no doubt left in the minds of those who witnessed the experiments or who have heard them reported that living tissues are as good a barometer as anything made by the artifice of man.

Caterpillars and worms are particularly susceptible to the most trivial changes in the surrounding atmosphere. They can, accordingly, be used by farmers who have no crickets and twines of their own to affect them, as warnings of coming showers. When the weather is hot and humid they exhibit a restlessness peculiarly their own.

The popular belief so long derided by science, that frogs are more numerous before a warm rain is now at last confirmed by the discovery that the high content of water vapor or humidity which precedes wet weather incites young frogs to kangaroo-like activity. They leave their watery homes and seek the fields and forests. Experiments performed on a large scale with an aquarium sunken in a garden prove this beyond all shadow of doubt.

Dragon flies, mosquitoes and fireflies are all suscep-

tible to changes in humidity and heat. Indeed, the so-called "land breeze" of the seashore resorts, supposed to blow hundreds of mosquitoes toward the hotels and homes on the shores, have been found to be not "land breezes" at all. It is not breezes, but the humidity and steam-like warmth which sets these mosquitoes to annoying mankind.

Just before a sultry Summer shower you may have noticed how the common house fly sticks to you and to one another. Close study of this phenomenon proves that it is inseparably associated with a definite percentage of moisture in the air. It is almost as sure a sign of rain as a falling barometer.

Obviously, then, if the living tissues of practically all kinds of animals—and it has also been long known that flowers, ferns and plants generally are thus influenced—are weather indicators of one sort or another, it is not at all absurd to conclude that human structures are equally alive to the water vapor changes, especially when of extreme degrees.

Moreover, when some unusually tender spot, such as a corn, a bunion, a swollen wrist, finger or other joint, is present, it is only what might be expected, to find that these weakened parts of your anatomy fail to adapt themselves to the changes going on round about.

This result is more exaggerated in the unresilient, inelastic tissues of old people. As you grow old your flesh becomes less and less adaptable. The scarred elements, the unhealed wounds, the miseries and sores often mislabeled "rheumatism," correctly foreshadow a change in the weather.

It's TOO MUCH LIGHT That RUINS OUR EYES

THERE is no organ of the body, outside of that limited group which is absolutely indispensable for the maintenance of life, which contributes more to human efficiency and personal comfort than does the eye. When we stop to consider the prolonged demands made on our organs of vision in these days of printing, and the shameful indifference with which we take care of them, it is surprising that they do not fail in their task more frequently than is actually the case.

The muscular and nervous systems give a warning when they are called on to do too much. Premontory symptoms of fatigue or pain serve to prevent harmful overtaxation. But our eyes rarely receive any studied consideration except at long intervals, and then usually under the pressure of impending damage to sight; nor are we concerned as a rule with any adjustment of the needs of the eyes, so as to relieve them of any unnecessary burdens or make their task easier.

The goal of the lighting engineer has up to the present time been to get the maximum output of light for a given expenditure of energy. The lighting problem, however, has a very important relation to the eye. If the system of illumination is unsuitable it may speedily produce a loss of efficiency for continued work, and great discomfort.

It is interesting to know that the industries concerned with the manufacture of lighting devices are recognizing the need of physiologists as a part of their scientific equipment. Commendable beginnings are being made in the effort to ascertain the merits of various lighting sys-

tems from the point of view of the individual rather than of the producing plant.

The four types of lighting systems in common use to-day are: Daylight, direct lighting systems, indirect systems and semi-direct systems. The evenness of illumination and the proper diffuseness of the light with exclusion of all extremes of surface brightness are ideal conditions best realized at present in the proper illumination of a room by daylight.

As Professor C. E. Ferree points out in a recent article, before it reaches our windows or skylights, daylight has been rendered widely diffuse by innumerable reflections. The windows and skylights themselves, acting as sources, have a broad area and low intrinsic brilliancy, all of which features contribute toward giving the ideal condition of distribution.

The best distribution effects given by artificial lighting are obtained with the indirect system in which the source is concealed from the eye and the light is thrown against the ceiling or some other diffusely reflecting surface. In the direct systems the tendency is to concentrate the light on the object viewed, and too often the eye is not properly shielded from the source of light. The semi-direct systems represent a compromise in which a part of the light is transmitted directly to the eye through a translucent reflector, and a part reflected to the ceiling. Like most other compromises, this one is not ideal.

Among the lighting factors which influence the welfare of the eye, those grouped under the heading "distribution" are apparently fundamental. The newest tests seem to indicate that where the light is well distributed in the fields of vision and there are no extremes of surface brightness,

intensities bright enough to give a maximum discrimination of detail may be employed without causing appreciable damage or discomfort to the eye.

For the kind of distribution effects given by the majority of lighting systems now in use too much light for the welfare and comfort of the eye is being employed. Under many of the systems of direct lighting the eye loses greatly in efficiency as the result of three or four hours of work. In this time it loses practically nothing under daylight, and little more under good systems of indirect lighting.

It is interesting to learn that the difference of opinion regarding the effect of the quality of light on the eyes is quite as widespread among the experts as among the general public. Professor Ferree is not prepared to admit the common belief that colored light, such as is furnished by the kerosene flame, gives better results for seeing than white light. So far as sharpness of vision is concerned the clear tungsten lamps yield nothing to the carbon lamps, which give a light comparatively rich in yellow.

If it is true that the kerosene flame is easier on the eye than the more modern sources of illumination, Professor Ferree is inclined to ascribe the benefit, whatever it may be, to the low intrinsic brilliancy of the kerosene flame. According to him, it may safely be stated that for the kind of distribution effects now obtained from most of our lighting systems, too much light is being used for the welfare and comfort of the eye.

"Our problem in lighting at present," he says, "is not so much how to see better as it is to see with more comfort and with less damage to the general health on account of eye-strain."

EARLY AFTERNOON the Time You're MOST LIABLE TO DIE

IT used to be thought that death was more liable to overtake us during the hours between midnight and dawn. The reason for this was supposed to be that during the hours when man for ages has been accustomed to rest in sleep the body's vitality reached its lowest ebb.

This is all wrong, as science has just discovered. The hours when the most deaths

occur are not between midnight and dawn, but in the early afternoon—the time of day when everybody in health feels most active and full of life.

For fourteen years Dr. Billing, a London physician, has been keeping a record of the time at which the deaths in a large hospital occurred. During that period there were 10,000 deaths.

On dividing the day into two periods of twelve hours each, he found that the deaths were almost equally divided between the period from 8 a. m. to 8 p. m., and that from 8 p. m. to 8 a. m. The variation between these two periods was so slight that he proceeded to divide the day into six periods of four hours each.

The result showed that the percentage of deaths between the hours of 11 p. m. and 3 a. m. was 17.06; between 3 and 7 a. m., 17.03; between 7 and 11 a. m., 15.15; between 11 a. m. and 3 p. m., 17.54; between 3 and 7 p. m., 16.83; and from 7 to 11 p. m., 16.39.

On examining the figures, it appears that the number of deaths between the hours of 11 p. m. and 7 a. m. is slightly above the average; after this time, there is a distinct

fall to a minimum of 15.15 between 7 a. m. and 11 a. m., followed by a rise in the afternoon to 17.54, the highest of the series. There is then a steady fall until 11 p. m., when the numbers rise again.

It therefore appears that the most fatal time is the early part of the afternoon, not the early morning, as usually stated, although the mortality is higher than the average at that time also. The period when the fewest deaths occur is that of the morning from 7 to 11.

Thus if a sick person survives the hours between midnight and dawn, which are next to the most fatal of all, the chances are in favor of living until noon. And if he survives the fatal early afternoon the chances are that midnight will find him still alive.

SCIENCE NOW KNOWS...

VOLCANOES ARE GOOD FERTILIZER PLANTS.

A SWISS scientist has discovered that the ashes which still largely cover the volcanic peaks of Hericulanum and Pompeii contain large quantities of potash and clay, from which an excellent agricultural fertilizer can be obtained. The whole region is very rich in potash, and it is said the Italian Government is seriously intending to organize the exploitation of "Vesuvius Mines."

A SUBSTITUTE FOR PLATINUM.

SO great is the demand for platinum, for use in electrical apparatus, that many efforts have been made to devise some substitute that can take its place and be produced at a moderate price. A recently patented substitute that is claimed to be suitable and satisfactory for silver and 15 per cent copper.

HOW WE LEAD THE WORLD IN TELEPHONES.

ON January 1, 1914, there were 13,700,000 telephones in the world, and 32,900,000 miles of telephone wire. This country, with 9,000,000 stations, owned 66 per cent of the total number in the world; while Europe, with less than 4,000,000, owned about 27 per cent. When we consider that the population of the United States is but 6 per cent of the world's population, and less than 25 per cent of that of Europe, our large proportion of telephone stations makes a remarkable showing. New York City alone has more telephones than Belgium, Hungary, Italy, Netherlands, Norway and Switzerland combined; there are more telephones in Chicago than in the whole of France, and more in Philadelphia than in the whole of Austria.

How DISEASE Can Make You a DIFFERENT Person

EVERYBODY who has ever been brought into close contact with a sufferer from tuberculosis must have noticed the peculiar changes when the disease often works in the patient's character and disposition. One of the most surprising of these effects is the almost supernatural optimism which frequently buoy the victim up, even on his death bed, and makes him go on cheerfully planning for the future long after his friends and physicians have abandoned all hope.

Professor Flinburg finds tuberculosis almost invariably producing either an exaggerated ego and colossal selfishness, or a great susceptibility to suggestion. This last explains the consumptive's credulity with respect to "fake" cures and their apparent improvement under such treatment.

To test the credulity of some of their tuberculosis patients, physicians at a Paris hospital recently announced to them a new cure which they dubbed "antiphosphorus," and which consisted simply of injections of a harmless salt solution. In order to excite the patients' interest they were kept waiting for a "specific" for a long time, and only "suitable" cases were selected for treatment.

When the treatment was finally given, the physicians were surprised to note in nearly every

case a phenomenal gain in weight. Temperatures became normal, and all other symptoms were improved. Even an examination of the diseased portions of the lungs showed great improvement.

The selfishness which is often a marked accompaniment of this disease is doubtless an outcome of the self-centered hygiene which its treatment demands. Professor Flinburg says that although the patient may vanquish the insidious germs of tuberculosis he will often survive as an unlovely character, spoiled forever.

Among the poorer classes the selfishness of consumptive patients is particularly noticeable.

Before entrance to a public sanatorium their existence may have been extremely precarious, yet after living a year or two on the bounty of the State or city they will criticize in the most

unjust fashion the diet and care they have received. Those unacquainted with the traits of this class of patients may easily be misled by their testimony.

The changes which tuberculosis brings about in a person's character are, of course, due to the poisoned condition of his blood. They are by no means always changes for the worse.

If the patient happens to be a person of high talent or positive genius, his mental power will often be augmented and exalted by the stimulus of the tuberculous by-products. Good examples of the valuable effects which these by-products may have upon the psychological switchboard are furnished by such men as Robert Louis Stevenson, Keats and Schiller, all of whom had tuberculosis.

A New Way To DRY YOUR HANDS

ELECTRICITY and sanitation go hand in hand in this enlightened age, as is evidenced by the invention of a Washington (D. C.) man, whose cleverness bids fair to put the "roller towel" of our ancestors and even the absorbent paper article of more recent date out of business for good.

Here is the idea: After washing your hands, turn to the "drying cabinet" and after inserting them in the "drying hole" press your foot upon a conveniently located lever. At once a deliciously warm, dry current of air envelopes them, and in a few seconds they are sanitarily and luxuriously dry.

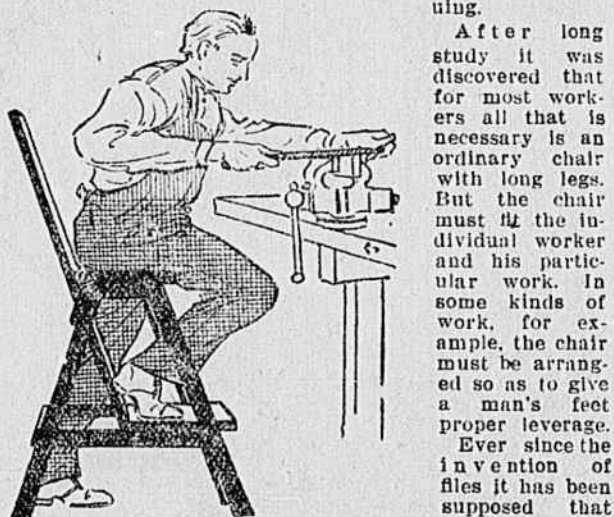
Why We Can All DO BETTER WORK SITTING DOWN

WITH a chair that's suited both to you and the kind of work you are doing, you can accomplish more with less effort when sitting down than when standing up. This is the newest advice of the efficiency experts. Many employers who have put the matter to a practical test are finding that comfort and increased output go hand in hand, and that man feels better and does better work if he sits down to his task than if forced to stand up.

Street railway companies report fewer accidents and

better service in every way when stools are provided for the motormen. And the fact that the conductors on the new side entrance, pay-as-you-enter street cars do better work and are less frequently absent on account of sickness is attributed to the fact that they are able to sit down the greater part of the time.

It was the success in increasing the efficiency of the brick layer by eliminating all unnecessary movements that led progressive employers to see if they could not increase the output of other workers by making their work less fatiguing.



The "Veranda" Chair, Which Enables the Filer to Do More and Better Work Sitting Down. The "Front Porch" Furnishes a Base for His Right Foot That Gives Him as Much Leverage as He Would Have When Standing.

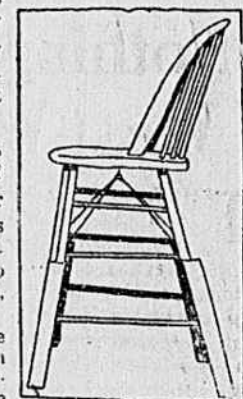
For the benefit of these filers Frank B. Gilbreth, the efficiency expert, has devised a special chair which gives the worker real comfort and enables him to turn out more work with less fatigue.

This is called a "veranda" chair, because it is fitted with a sort of "front porch" to furnish a base for the right foot and give the man as much leverage as if he were standing up. It has extra long legs to bring a man to the proper height, and a high supporting back.

Some of the efficient factories are supplying their employees with chairs having well-oiled, ball-bearing casters, so that they can be pulled or pushed about from place to place with the greatest ease. In such a chair a worker can shoot about the little space around his bench almost as fast as he could walk, and without wasting any time in getting up or in carrying a chair about.

Mr. Gilbreth, for example, recently discovered that many operators suffered undue fatigue because they had to keep one foot on the treadle all the time in order to be able to stop the power machine instantaneously. The wearing jar of muscles and nerves which the treadle's vibration caused is now eliminated by the use of a simple device which enables the operator to stop her machine without keeping her foot on the treadle.

To aid employers in lightening the toll of their workers, safeguarding their lives and health and increasing their output what is known as the "Fatigue Museum" has been established in Providence. Here are shown side by side for purposes of study and comparison the most efficient and the most inefficient factory appliances, including chairs, benches and even shoes, overalls and other articles of apparel.



A Specially Constructed Chair Which Saves Thousands of Factory Girls from Being on Their Feet in getting up or in carrying a All Day Long.